GRADE 3 SCIENCE CURRICULUM SPECIFICATIONS

REVISED

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The Grade 3 Science Curriculum Specifications were prepared in July, 1981, under the direction of the Curriculum Branch of Alberta Education, by the Grade 3 Science Committee. The committee consisted of classroom teachers, School Board personnel and Alberta Education personnel. Alberta Education acknowledges with appreciation the contributions of the members of the Grade 3 Science Committee.

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Four considerations were identified by the committee as major criteria underlying the curriculum specifications for Grade 3 Science Achievement Test.

1. Curriculum specifications are to be based wholly on the *Program of Studies for Elementary Schools, 1978* (amended 1981).

2. The curriculum specifications are a reflection of the four major program components or divisions that comprise science content from grades 1 through 12. These components are:

    Process Skills
    Psychomotor Skills
    Attitudes
    Subject Matter

3. Emphases presented are a reflection of what the committee considers to be current status of Division I Science in Alberta. Percentage and priority weightings are given for each of the components.

4. In recognition of the nature of the elementary science program, greater emphasis is to be placed on those program components that students have attained throughout Division I.

WEIGHTING FACTORS

Percentage

- refers to the relative emphasis that a particular program component or division will receive.

Priority

- refers to the relative importance of a particular program concept, sub-concept or objective.

A	B	C
high priority		low priority

Table 1 outlines the percentage of classroom time recommended for each of the four major components of the science curriculum. Table 2 presents the same percentages as they are subdivided for each of the major components. Table 3 outlines detailed curriculum specifications.

Table 1

Grade 3 Science - Major Curriculum Components

MAJOR COMPONENTS	EMPHASIS IN PERCENT
PROCESS SKILLS	55
PSYCHOMOTOR SKILLS	10
ATTITUDES	15
SUBJECT MATTER	20
TOTAL	100

REVISION PROCESS

The interim edition of these curriculum specifications was distributed in the fall of 1981 with reactions to be returned to the Student Evaluation Branch by December 31, 1981. These reactions were then collated and submitted to the Curriculum Branch for revision of the specifications. The revision committee met in late January and made such changes as were considered necessary.

Table 2

Grade 3 Science Curriculum Subdivisions

SUBDIVISIONS	EMPHASES IN PERCENT	
PROCESS SKILLS		
Observing	13	
Measuring	10	
Classifying	10	55
Communicating	12	
Inferring	5	
Predicting	5	
PSYCHOMOTOR SKILLS		
Manipulating	4	
Constructing	4	10
Spatial relations	2	
ATTITUDES		
Toward science	10	15
Other	5	

TABLE 3

Grade 3 Science Curriculum Specifications

PRIORITY	MAJOR DIVISIONS AND SUBDIVISIONS		EMPHASES IN PERCENT	TAXONOMIC LEVELS		
				KNOWLEDGE	APPLICATION & INTERPRETATION	HIGHER MENTAL PROCESSES
	PROCESS SKILLS (55%)					
A	Observing	1. Identifying, using the five senses, properties or characteristics of objects.				
A		2. Describing (verbally and in written work) an object on the basis of sensory information.				
C		3. Describing <u>qualitative</u> changes within objects.	13			
C		4. Distinguishing between observations and inferences.				
C		5. Describing objects, change and interaction of objects in the environment.				
C		6. Making predictions and inferences on the basis of observation.				
A	Measuring	1. Using simple instruments for measurement.	↓			
B		2. Selecting appropriate devices for measuring.				
B		3. Collecting data using appropriate measuring devices.				

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PRIORITY		MAJOR DIVISIONS AND SUBDIVISIONS	EMPHASES IN PERCENT	TAXONOMIC LEVELS		
				KNOWLEDGE	APPLICATION & INTERPRETATION	HIGHER MENTAL PROCESSES
C	Measuring	4. Estimating the approximate measure of an object.				
C		5. Organizing measurement data into communicable forms such as graphs, maps, tables, etc.				
C		6. Making comparative measurements – lighter than, heavier than.	10			
C		7. Ordering on the basis of comparative measurements.				
C		8. Using arbitrary measurement units (washers, paper clips, swings of a pendulum).				
C		9. Discovering the need for a standard unit.				
A	Classifying	1. Identifying the condition or basis of a given classification set.				
A		2. Applying a self-devised classification scheme to a given set of objects, situations, or events.	10			
A		3. Classifying objects according to attributes or properties (color, shape, size, texture, etc.).				
B		4. Classifying objects first on one property, then on the basis of two properties and so on.				

PRIORITY	MAJOR DIVISIONS AND SUBDIVISIONS	EMPHASES IN PERCENT	TAXONOMIC LEVELS		
			KNOWLEDGE	APPLICATION & INTERPRETATION	HIGHER MENTAL PROCESSES
C	5. Classifying objects, situations, or events according to given, or to self-imposed, conditions.				
A	1. Describing verbally the observable properties of objects.				
A	2. Describing verbally an object as it undergoes change.				
B	3. Describing observations in written form: simple words, phrases to sentences, paragraphs, reports.				
B	4. Constructing simple pictographs and bar graphs.	12			
C	5. Drawing simple diagrams.				
C	6. Using written units of measurement and their symbols.				
C	7. Recording responses by using simple symbols: x's. √'s				
C	8. Filling in charts using simple symbols.				
A	1. Making observations by using all five senses.				
C	2. Making as many observations as possible, and choosing only those inferences that account for all observations made.				

(Communicating — vertical label spanning subdivisions 1–8)

(Inferring — vertical label spanning subdivisions 1–2)

PRIORITY		MAJOR DIVISIONS AND SUBDIVISIONS	EMPHASES IN PERCENT	TAXONOMIC LEVELS		
				KNOWLEDGE	APPLICATION & INTERPRETATION	HIGHER MENTAL PROCESSES
C	Inferring	3. Testing inferences by making more observations, and revising inferences if additional observations do not support the original inference.				
C		4. Making and testing inferences when confronted with unfamiliar phenomena.				
C		5. Applying the inferring process to situations which require direct observations.	5			
C		6. Describing objects, situations and events in written form in reports, etc.				
C		7. Using units of measurement, and their symbols, to communicate quantitative observations.				
A	Predicting	1. Constructing reasonable predictions that have been based on past experience.				
C		2. Measuring for accuracy.	5			
C		3. Testing the results of a prediction by: a. teacher-directed tests b. student-constructed tests.				

SUBJECT MATTER			
Matter and energy			
1. Properties of objects	2		
2. Properties of matter	3	8	
3. Energy	3		
Living things and environment			20
1. Living things	1		
2. Plants and animals	4	9	
3. Populations	1		
4. Environment	3		
Earth/Space/Time			
1. Position and direction	1	3	
2. Order and time	2		
TOTAL			100

PRIORITY		MAJOR DIVISIONS AND SUBDIVISIONS	EMPHASES IN PERCENT	TAXONOMIC LEVELS		
				KNOWLEDGE	APPLICATION & INTERPRETATION	HIGHER MENTAL PROCESSES
		PSYCHOMOTOR SKILLS (10%)				
A	Manipulating	1. Materials.				
A	Manipulating	2. Equipment.	4			
A	Manipulating	3. Measuring tools.				

A	Constructing	1. Using materials to demonstrate an idea
		
		a. two dimensional models
		  - drawing
		  - paper construction
		
		b. three dimensional models.
			4			

B	Spatial relationships	1. Direction and position in relation to self and to reference points.	2			
		ATTITUDES (15%)				
A	Direct to the elementary science program	1. An awareness of, appreciation of and interest in the environment, and the need for a responsible attitude toward conservation.				
A	Direct to the elementary science program	2. An appreciation of the beauty, uniqueness, and interdependence of all living things.	10			
B	Direct to the elementary science program	3. An interest in the value of science as a means of understanding the world.				

PRIORITY		MAJOR DIVISIONS AND SUBDIVISIONS	EMPHASES IN PERCENT	TAXONOMIC LEVELS		
				KNOWLEDGE	APPLICATION & INTERPRETATION	HIGHER MENTAL PROCESSES
C		4. An awareness of, and concern for, the responsible use of energy resources.				
C		5. An appreciation of science, and the scientific enterprise, in terms of the impact it has made on our lives.				
A	Additional	1. Self-confidence on the part of students in their own developing abilities to explore and interpret objects and events in their own local environment.	5			
B		2. A continuing interest in each area of science.				
	SUBJECT MATTER (20%)					
		1. Properties of objects.				
A		a. Objects can be compared, ordered and classified according to one or more properties.			A	A
B	Matter and energy	b. Properties of objects can be determined through the use of the senses (touch, hearing, taste, smell, smell, sight).	2		A	
B		c. Color, shape, size, texture, hardness and mass are properties of samples of matter.	8		A	
C		d. Objects exhibit a number of properties.			A	

PRIORITY		MAJOR DIVISIONS AND SUBDIVISIONS	EMPHASES IN PERCENT	TAXONOMIC LEVELS		
				KNOWLEDGE	APPLICATION & INTERPRETATION	HIGHER MENTAL PROCESSES
		2. Properties of matter.				
A		a. Samples of solids have distinct properties: - they tend to retain their shape - they can be poured only if in small pieces - they have measurable mass.		A	A	
A		b. Liquids have distinct properties: - they take the shape of the container - they can be poured - they can form drops.		A	A	
A	Matter and energy	c. Gases have distinctive properties: - they occupy space - they exert pressure - they have mass - they are not necessarily odorless and colorless.	3	A	A	
B		d. Some solids are attracted by magnets; others are not attracted by magnets.		A	A	
B		e. Matter can undergo changes by heating, cooling, freezing, melting.		A	A	
C		f. Some solids can be classified as metals.		A	A	
C		g. Some solid materials float in water; some solids sink in water.		A	A	

PRIORITY		MAJOR DIVISIONS AND SUBDIVISIONS	EMPHASES IN PERCENT	TAXONOMIC LEVELS		
				KNOWLEDGE	APPLICATION & INTERPRETATION	HIGHER MENTAL PROCESSES
C		h. Some solids dissolve readily in water; others do not.		A	A	
C		i. Magnets either attract or repel other magnets.			A	
C		j. Liquids vary in the degree of specific properties such as: – color – transparency to light – viscosity – density.		A	A	
	Matter and energy	3. Energy				
A		a. Plants and animals use energy from the sun.			A	
A		b. Humans can exhibit behaviors that conserve energy in their environment (home, school).			A	A
B		c. There are different forms of energy (e.g. heat, light, sound, electricity).	3	A	A	
B		d. Temperature is a measure of heat energy and can be measured with a thermometer.			A	
B		e. The sun is a source of light and heat.			A	
C		f. A change in heat energy generally causes matter to expand or contract.			A	

PRIORITY		MAJOR DIVISIONS AND SUBDIVISIONS	EMPHASES IN PERCENT	TAXONOMIC LEVELS		
				KNOWLEDGE	APPLICATION & INTERPRETATION	HIGHER MENTAL PROCESSES
		1. Living things				
B		a. Things can be classified as living or nonliving on the basis of the following characteristics: - Living: need food and water, grow, die, reproduce. - Nonliving: do not need food and water, do not grow, do not die, do not reproduce.	9 1	A	A	
B	Living things and environment	b. Living things can be classified according to properties: method of locomotion, habitat, food gathering, structure, life cycle.			A	A
		2. Plants and animals				
A		a. Plants differ from animals in the specific ways in which they obtain food, react to stimuli, and move.			A	A
A		b. Plants are living things which: - require water and sunlight (for most plants) - grow - need soil or other sources of nutrients.	4		A	
A		c. Animals are living things which: - grow - feed on other animals and plants - move - reproduce.			A	

PRIORITY	MAJOR DIVISIONS AND SUBDIVISIONS		EMPHASES IN PERCENT	TAXONOMIC LEVELS		
				KNOWLEDGE	APPLICATION & INTERPRETATION	HIGHER MENTAL PROCESSES
B		d. Seeds have certain requirements for growth and are dispersed in many ways.		A		
B		e. Plants and animals live in many different habitats within an environment.			A	
B		f. Young plants resemble their parents. Some animals reproduce young which resemble their parents. Other animals do not resemble their parents until they mature.			A	
B	Living things and environment	g. Animals (e.g. families, species) have similar and different characteristics.			A	A
C		h. Domestic animals require care to meet their needs.			A	
C		i. Plants and animals respond to stimuli in their environment (light, moisture, temperature, food).			A	A
		3. Populations				
B		a. Populations are in a state of change. They are affected by: - environmental factors (moisture, temperature, light) - other populations, e.g. predators, man.	1		A	A
C		b. The term "population" describes a group of organisms of the same kind in a particular environment.			A	

PRIORITY		MAJOR DIVISIONS AND SUBDIVISIONS		EMPHASES IN PERCENT	KNOWLEDGE	APPLICATION & INTERPRETATION	HIGHER MENTAL PROCESSES
						TAXONOMIC LEVELS	
C		c.	The place of a population is its habitat.			A	
C		d.	Populations in a particular habitat form a community.			A	
		4. Environment					
A	Living things and environment	a.	It is important to protect and maintain the environment.				A
B		b.	Humans can change the environment in many ways.	3		A	A
B		c.	The environment plays an important role in our lives.			A	A
C		d.	The environment can be classified as man-made or as natural.				A
		1. Position and direction					
B	Earth/Space/Time	a.	An object's position can be determined by using a simple grid.			A	A
B		b.	An object's position, size and direction can be described by the terms: up/down, forward/back, right/left, short/tall, in/out, near/far, and above/below.	1 3		A	
C		c.	Distance can be measured using standard and nonstandard units.				

PRIORITY	MAJOR DIVISIONS AND SUBDIVISIONS		EMPHASES IN PERCENT	TAXONOMIC LEVELS		
				KNOWLEDGE	APPLICATION & INTERPRETATION	HIGHER MENTAL PROCESSES
C	Earth/Space/Time	d. The position of an object is determined relative to arbitrarily chosen reference points.				A
		2. Order and time				
A		a. Some changes occur in a regular pattern and can be ordered (e.g. seasons, plant and animal growth).	2		A	A
A		b. Some changes are reversible (e.g. freezing, melting) and others are not (e.g. rusting, rotting).			A	
C		c. Some changes occur slowly and others occur rapidly.			A	
C		d. Weather can exhibit different kinds of change.			A	
C		e. Various changes occur in the environment over periods of time (e.g. effects of erosion, decomposition, weathering).		A	A	